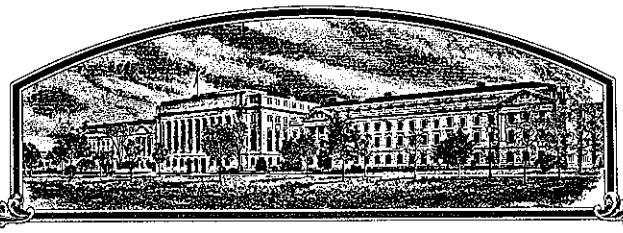
No. 8300018



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Texas Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT TY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS Y THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

KLEINGRASS

'Verde'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington *this* 27th *day of* October *in the year of our Lord one thousand nine hundred and* eighty-three.

Attest:

Kenneth A. Evans

Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

John R Block

Secretary of Agriculture

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

FORM APPROVED
OMB NO. 40-R3822

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

1a. TEMPORARY DESIGNATION OF VARIETY	1b. VARIETY NAME	FOR OFFICIAL USE ONLY
77-28	Verde	PV NUMBER 8300018
2. KIND NAME: Kleingrass	3. GENUS AND SPECIES NAME: Panicum coloratum L.	FILING DATE 12/6/82 / TIME 11:30 A.M. XXX P.M.
4. FAMILY NAME (BOTANICAL): Gramineae	5. DATE OF DETERMINATION: 1978 fol. eval. of poly. prog 1981 fol. agronomic eval.	FEE RECEIVED $ 1,000 $ 500 / DATE 12/6/82 10/7/83
6. NAME OF APPLICANT(S): Texas Agricultural Experiment Station	7. ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*): Texas A&M University College Station, Texas 77843	8. TELEPHONE AREA CODE AND NUMBER: 713-845-4051

9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (*Corporation, partnership, association, etc.*)	10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION	11. DATE OF INCORPORATION
State Agricultural Experiment Station		

12. NAME AND MAILING ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS:
Mr. Harvey Walker, Foundation Seed Section Leader, Texas Agricultural Experiment Station, College Station, Texas 77843

13. **CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:**

- [X] 13A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- [X] 13B. Exhibit B, Novelty Statement.
- [X] 13C. Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*
- [X] 13D. Exhibit D, Additional Description of the Variety.

14a. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a). (If "Yes," answer 14B and 14C below.)* [X] YES [ ] NO

14b. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	14c. IF "YES," TO 14B, HOW MANY GENERATIONS OF PRODUCTION BEYOND BREEDER SEED?
[X] YES [ ] NO	[X] FOUNDATION [ ] REGISTERED [X] CERTIFIED

15a. DID THE APPLICANT(S) FILE FOR PROTECTION OF THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

15b. HAVE RIGHTS BEEN GRANTED THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

16. DOES THE APPLICANT(S) AGREE TO THE PUBLICATION OF HIS/HER (THEIR) NAME(S) AND ADDRESS IN THE OFFICIAL JOURNAL? [X] YES [ ] NO

17. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

11-29-82
(DATE)

Harvey J. Walker
(SIGNATURE OF APPLICANT)

(DATE)

(SIGNATURE OF APPLICANT)

FORM GR-470 (1-78)

VERDE KLEINGRASS

Exhibit 13A. Origin and Breeding History of Variety

13a. (1) Geneology and breeding history.

Open pollinated seed were collected in 1972 from approximately 4,000 individual plants originating from 30 plant introductions from Africa. The seed were separated in an air column calibrated to remove all but the heaviest seed.

(2) Subsequent collection and multiplication.

Approximately 70 plants were identified based on percentage of heavy seed and individual seed weight. A parent - o.p. progeny nursery was established in 1973 and evaluated for seed weight in three separate seed harvests. In 1974 the top 11 parent clones were established in an isolated polycross block and the top 15 o.p. progeny were established in a second polycross block. A replicated parent-polycross progeny nursery was established in 1975 and evaluated for seed weight in three seed harvests using Kleingrass 75 as a check. Because of the similarity in performance of the two crosses (18.5 to 25.5% increase in seed weight over Kleingrass 75), the parents of both crosses were combined in a new polycross in 1977 after eliminating six parent clones based on progeny performance. Performance of the combined cross was about the same as the original crosses (19% increase in seed weight over Kleingrass 75). Breeders seed was produced in an isolated block established in rows from transplanting 100 seedlings from each of the 20 parent clones, parental sources being completely randomized within each row. Foundation seed is produced from the breeders seed. Certified seed

is produced only from foundation seed; there is no registered seed class.

(3) Variants

Seed weight is quantitatively inherited and there are no actual variants in seed weight. Selection was for seed weight (size) based on mean weights of seeds collected from individual plants at similar stages of maturity followed by intercrossing of selected plants. Seed weight is influenced genetically, environmentally, and by stage of maturity. Seed mature from the inflorescence tip downward and inflorescences develop and mature over an extended period of time. Thus, seed in all stages of maturity are harvested at any one time. Verde individual seed weight ranges from about 0.5 to 1.5 mg/seed while Kleingrass 75 ranges from 0.5 to 1.3 with means of 0.85 to 1.0 and 0.7 to 0.85 mg/seed, respectively. Seed weight distribution of Verde follows a normal distribution curve for multiple gene inheritance (Table 1). Kleingrass 75 seed size is skewed toward smaller seed. The increased seed size in Verde represents a shift in the population toward larger seed. The extremes in the distribution pattern do not represent variants but rather the expected pattern for a multigenic characteristic.

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[1]Kieschnick, R. C. 197 . Seed size relationships in Kleingrass, Panicum coloratum L. M.S. Thesis, Texas A&M University.

[2]Hussey, M. A. 1979. Selection for increased seed weight in Panicum coloratum L. and its relationship to early seedling performance. M.S. Thesis. Texas A&M University.

(4) Uniformity and stability

Predicted heritability[1] based on parent - o.p. progeny correlation and regression was 68% but realized heritability in the first cycle of selection for seed weight was 71%[2]. The data including range among progeny plants are shown in Table 2. Further progress has been made in selection for increased seed weight[3] but the experimental materials have not been adequately tested for agronomic performance. It is expected that seed weight of a synthetic would decline to some extent in advanced generations which is the reason for limiting the seed increase to two generations from breeders seed. Breeders seed is the same generation as polycross progeny of the parental clones. The breeders seed increase block was established as spaced plants using equal numbers of polycross progeny seedlings from each parent clone located at random within subblocks consisting of one polycross progeny from each of 20 parent clones. The subblocks were repeated approximately 100 times. Thus there was no generation advance from the polycross progeny test to the breeders seed increase. The first generation increase from the polycross (random interpollination of selected parent clones) is the foundation seed. Even though foundation seed were produced in a different year and environment, when the seed were subjected to the same cleaning treatment, seed weights averaged 3% less than breeders seed which is in the expected range of decrease for the Syn_1, generation, Table 2a. The characteristic is expected to stabilize at that level (slightly less than breeders seed) for self-sterile or largely cross

pollinated species if interpollination is random among genotypes. There will be only one generation advance above the Syn_1.

Seedling vigor is closely related to seed weight and its stability is dependent on seed weight stability. Since the evidence points to seed weight stability in advanced generations, seedling vigor also is assumed to be stable.

While plant pubescence is somewhat less in Verde than Kleingrass 75, the characteristics is not considered important. It was measured in the polycross progeny generation and should show the same stability as seed weight.

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[3]Hussey, M. A. and E. C. Holt. 1982. Selection and evaluation of heavy seed weight synthetic cultivars of kleingrass. In Forage Research in Texas. Texas Agric. Exp. Stn. CPR - 4024. p. 59-66.

Exhibit 13B. Novelty Statement

The only commercially available Panicum coloratum L. in the United States is the cultivar Kleingrass 75. All comparisons will be with that cultivar. Kleingrass 75 is an increase of a P.I. and is morphologically variable. Thus, comparisons are on the basis of means and sometimes ranges.

Increased seed size and seedling vigor are the only important novelty characteristics of Verde kleingrass. The caryopsis in Panicum coloratum is tightly enclosed in the lemma and palea, thus this seed unit will be referred to as the seed. The spikelet consists of glumes, a sterile floret and the fertile floret. However, the fertile floret at maturity always disarticulates above the sterile lemma and palea.

Verde kleingrass, compared to Kleingrass 75, produces larger and heavier seed (Table 3). The seed are about 10% longer (2.34±.04 mm vs. 2.12±.04 mm) and 10% wider (1.11±.10 vs. 0.98±.04).

Verde seed are 20% to 30% heavier than Kleingrass 75. Within seed lots treated comparably, individual seed weights were 1.04± .04 mg vs. 0.82±.03 mg. Seed weight will vary to some extent dependent on environmental conditions during maturation and the degree of removal of immature seed in the cleaning process. But the percentage increase has been consistently 20% or more. Flag leaf length and width do not differ between the two cultivars (Table 3).

Seedling weight (above ground) is an indication of seedling vigor. Seedling vigor is important in stand establishment.

Table 1. Frequency distribution (percentage) of seed size classes.

Cultivar	Size class (mg/100 seed)					
	<60	60-79	80-99	100-119	120-140	>140
	% of total in each class					
Verde	1	9	37	38	10	5
Kleingrass	1	51	35	11	2	

Table 2. Summary of results of first cycle of selection for heavy seed weight in kleingrass.

	Cycle 0	Cycle 1
Mean	79.3[1]	100.8
Range	25.0-131.6	63.7-144.1
Std. dev.	13.7	11.0
Klein. 75	-	83.2
% Increase	-	27.1
Parent-progeny correlation	0.61	0.78

[1]All seed weights are expressed as mg/100 seed.

Table 2a. Seed weight stability in advanced generations of Verde kleingrass.

Generation	Year of Seed production	Seed wt. mg/seed
Parent clones	1978	0.98
Polycross progeny	1978	.98
Breeders seed (polycross progeny)	1980	1.08
	1981	1.09
	1982	1.07
Foundation Seed (synthetic generation	1982	1.05
Certified seed	?	?

Increased seedling vigor of Verde over Kleingrass 75 has been shown in both controlled environment and field studies (Tables 4 and 5).

Tubercle-based hairs are found on leaf margins, especially near the collar, of Panicum coloratum leaves, and leaf blade and sheath may have similar pubescence or hairs. A higher percentage of Kleingrass 75 than Verde leaves possess surface pubescence (Table 6). Surface hairs may be present on either or both the upper and lower leaf blade surface and/or the leaf sheath. About 25% of Verde plants show leaf surface pubescence while some 65% of Kleingrass 75 plants show pubescence. However, leaf hairs is not considered an important or distinguishing characteristic.

Table 3. Kleingrass seed and vegetative characteristics.

Characteristic	Verde		Kleingrass 75	
	Range	Mean	Range	Mean
Seed length (mm)	2.1-2.5	2.34±.04[1]	1.8-2.4	2.12±.04
Seed width (mm)	0.8-1.7	1.11±.04	0.7-1.25	0.98±.04
Spikelet length (mm)	3.0-3.7	3.23±.10	2.5-3.7	3.15±.12
Weight/seed (mg)	0.51-1.54	1.04±.04	0.52-1.27	0.82±.03
Flag leaf width (mm)	2-9	5.8±.61	3-10	5.7±.23
Flag leaf length (cm)	8-22	13.9±.44	7-27	13.8±.55

[1]Confidence interval at 95% probability level.

Table 4. Kleingrass seedling emergence and vigor.[1]

Cultivar	Emergence	Seedling vigor
	%	mg/100 seedlings[2]
Verde	20.8 b	104 a
Kleingrass 75	14.6 cde	62 bc
Experimental 78-30	30.5 a	72 b
Experimental 78-35	28.3 a	106 a
Experimental 79-34	18.3 bc	60 bc
Experimental 75-25	17.7 bcd	52 d

Values followed by a common letter are not significantly different (0.05 level), Duncan's Multiple Range.

[1]Study conducted in controlled environment box at 24 C, 14/10 light/dark photoperiod, 1,000 μEm^{-2} Sec^{-2}.

[2]30 days post emergence, average of three planting depths, (2.5, 5, 7.5 cm).

Table 5. Field emergence, seedling weight and stand evaluation of kleingrass cultivars.

Cultivar	Seed wt. mg/100 seed	Plants/m[1]	Seedling wt. mg/seedling	Establishment rating[2]
Verde	90.9	43 a[3]	13.5 ab	7.8 a
Kleingrass 75	70.1	32 a	11.3 ab	4.8 b
Experimental 79-35	107.8	43 a	13.7 a	7.0 a
Experimental 77-30	100.9	42 a	13.5 ab	7.5 a
Experimental 75-25	66.1	28 a	8.9 ab	4.0 b
Experimental 79-34	61.6	24 a	10.1 b	4.3 b

[1]Plants per linear meter of 50 cm wide rows from 73 viable seed.

[2]Rating including both number and size of seedlings with 10=maximum.

[3]Values in a column followed by same letter are not significantly different (0.05 level), Duncan's Multiple Range.

Table 6. Kleingrass leaf pubescence.

Cultivar	Percentage of tillers with pubescence				
			Leaf blade		
	None	Sheath only	Upper surface	Lower surface	Both surfaces
Verde	77	1	16	2	4
Kleingrass 75	34	7	22	11	26

FORM APPROVED: OMB NO. 40-R3712

FORM GR-470-36
(9-76)

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

OBJECTIVE DESCRIPTION OF CULTIVARS

RYEGRASS (Lolium spp.) KLEINGRASS (Panicum coloratum)

NAME OF APPLICANT(S)

Texas Agricultural Experiment Station

ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code)*

Texas A&M University
College Station, Texas 77843

VARIETY NAME OR TEMPORARY DESIGNATION

Verde

FOR OFFICIAL USE ONLY

PVPO NUMBER

8300018

Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in first box (e.g. [0][8][9] or [0][9])when number if either 99 or less or 9 or less. Descriptions of characters should represent those that are typical for the variety. Ranges may be given also. Measured data should be for SPACED PLANTS. Give additional description for all characteristics that cannot be adequately described in the form below. Append all petrinent comparative trial and evaluation data.

1. SPECIES:

[5] 1 = L. MULTIFLORUM (annual or Italian: includes Westerwoldicum) 2 = L. PERENNE (perennial) 3 = L. RIGIDUM (includes Wimmera)
4 = HYBRID (of species) _____ 5 = OTHER *(Specify)* Panicum coloratum

2. PLOIDY:

[2] 1 = DIPLOID 2 = TETRAPLOID 3 = OTHER *(Specify)* _____

3. DURATION:

[3] 1 = ANNUAL OR BIENNIAL 2 = SHORT LIVED PERENNIAL (3-4 years) 3 = PERENNIAL (more than 4 years)

STANDARD CULTIVARS

1 = GULF 2 = WIMMERA 62 3 = LINN 4 = PELO 9=Kleingrass 75
5 = NORLEA 6 = ABERYSTWYTH S-23 7 = MANHATTAN 8 = PENNFINE

4. MATURITY (50% HEADED) Use standards from above for comparison:

[5] 1 = VERY EARLY 3 = EARLY 5 = MEDIUM 7 = LATE 9 = VERY LATE

[ ][ ] DAYS EARLIER THAN . . . . . [ ] STANDARD CULTIVAR
[0][7] DAYS LATER THAN . . . . . [9] STANDARD CULTIVAR

5. MATURE PLANT HEIGHT (Use standard cultivars from above) :

[1][0][6] CM. HIGH to 122 [0][0][0] CM. SHORTER THAN . . . . . [9] STANDARD CULTIVAR
[0][0][0] CM. TALLER THAN . . . . . [9] STANDARD CULTIVAR

6. PERCENT WINTER DAMAGE (estimated as percent of the area appearing dead). Use standard cultivars from above for comparison:

[0][1][2] PERCENT DAMAGE OF APPLICATION CULTIVAR
[0][1][0] PERCENT DAMAGE OF . . . . . [9] STANDARD CULTIVAR at College Station, Texas

7. TURF DENSITY Use standard cultivars from above: Not applicable

[ ][ ][ ] TILLERS PER 100 SQ. CM.
[ ][ ][ ] LESS TILLERS PER 100 SQ. CM. THAN . . . . [ ] STANDARD CULTIVAR
[ ][ ][ ] MORE TILLERS PER 100 SQ. CM. THAN . . . [ ] STANDARD CULTIVAR

8. FLAG LEAF (at full growth) Use standard cultivars from above:

[0][1][4] CM. LENGTH (from ligule to tip) [0][0][6] MM. WIDTH (at widest point)
[0][0][0] CM. SHORTER THAN . . . . . [9] STANDARD CULTIVAR
[0][0][0] CM. LONGER THAN . . . . . [9] STANDARD CULTIVAR
[0][0][0] MM. NARROWER THAN . . . . . [9] STANDARD CULTIVAR
[0][0][0] MM. WIDER THAN . . . . . [9] STANDARD CULTIVAR

[1] FLAG LEAF AT BOOT STAGE: 1 = DEFLEXED 3 = RECURVED 5 = HORIZONTAL 7 = SEMI-ERECT 9 = ERECT

P 11

8300018

STANDARD CULTIVARS

1 = GULF 2 = WIMMERA 62 3 = LINN 4 = PELO 9=Kleingrass 75
5 = NORLEA 6 = ABERYSTWYTH S-23 7 = MANHATTAN 8 = PENNFINE

9. LEAVES:

[1] VERNATION: 1 = LEAVES ROLLED IN YOUNG SHOOTS; 2 = LEAVES SEMI-ROLLED (folded with rolled edges); 3 = LEAVES FOLDED IN YOUNG SHOOTS

[0 9 0] % PLANTS WITH ANTHOCYANIN IN LOWER LEAF SHEATH

[2] FOLIAGE COLOR: 1 = YELLOW GREEN; 2 = MEDIUM GREEN; 3 = BLUE GREEN

10. SPIKE:

[0 0 3] MM. SPIKE LENGTH (tip to internode below lowest floret) let

[0 0] MM. SHORTER THAN [9]

[0 0] MM. LONGER THAN [9]

USE STANDARD CULTIVARS FROM ABOVE

[ ] MG. PER TEN SPIKES (trimmed to internode below lowest floret) Not applicable

[ ] MG. LIGHTER PER TEN SPIKES THAN [ ]

[ ] MG. HEAVIER PER TEN SPIKES THAN [ ]

USE STANDARD CULTIVARS FROM ABOVE

[0 2] FLORETS PER SPIKELET

PERCENTAGE OF PLANTS WITH:

RACHIS: [ ] % SMOOTH not applicable [ ] % ROUGH

SPIKE COLOR: let [0 9 0] % GREEN [0 1 0] % PURPLE

LEMMA: [0 0 0] % AWNED [0 0 0] MM. AWN LENGTH

1 98 11 6/27/83

[0 1.1] MM. GLUME LENGTH 1st [0 3.2] mm 2nd glume

[2] 1 = SPIKELET LENGTH NEARLY EQUAL TO OUTER GLUMES; 2 = SPIKELET LENGTH MUCH LONGER THAN OUTER GLUMES

11. COLEOPTILE:

[0 0 0] % PLANTS WITH ANTHOCYANIN IN COLEOPTILE

12. ANTHER COLOR:

[ ] % PLANTS WITH WHITE ANTHERS [ ] % PLANTS WITH YELLOW ANTHERS

[1 0 0] % PLANTS WITH PURPLE ANTHERS

13. ROOT AND PLANT CHARACTERS:

[0 0 0] % PLANTS WITH PROSTRATE GROWTH HABIT [ ] % PLANTS WITH FLUORESCENT ROOTS

[1 0 0] % PLANTS WITH UPRIGHT GROWTH HABIT

12

14. SEED: Verde

[1 0 4] MG. PER 1,00 SEED Kleingrass 75

[0 2 3] MM. TOTAL LENGTH OF 10 SEEDS

[0 1 1] MM. TOTAL WIDTH OF TEN SEEDS

0 8 2 0 2 1 0 1 0

15. DISEASE (0 = NOT TESTED, 2 = HIGHLY SUSCEPTIBLE, 4 = MODERATELY SUSCEPTIBLE, 6 = MODERATELY RESISTANT, 8 = HIGHLY RESISTANT):

[ ] Not applicable CROWN RUST (Puccinia coronata)	[ ] DOLLAR SPOT (Sclerotinia)	[ ] BROWN PATCH (Rhizoctonia)
[ ] LEAF SPOT (Helminthosporium)	[ ] MILDEW	[ ] OTHER *(Specify)*
[ ] SNOW MOLD (Typhula)	[ ] RED THREAD (Corticium)	_____

16. INSECT (0 = NOT TESTED, 2 = HIGHLY SUSCEPTIBLE, 4 = MODERATELY SUSCEPTIBLE, 6 = MODERATELY RESISTANT, 8 = HIGHLY RESISTANT):

[0] *(Specify)* _____

17. GIVE RESEMBLANCE VALUE IN LEFT COLUMN AND VARIETY CODE NUMBER IN RIGHT COLUMN FOR VARIETY WITH WHICH COMPARISON IS MADE (1 = LESS THAN, 2 = SAME AS, 3 = MORE ERECT, MORE RESISTANT, DENSER, MORE PERSISTENT, DARKER OR GREATER HEIGHT.):

RESEMBLANCE	CHARACTER		SIMILAR VARIETY
[2]	PLANT HABIT (erectness)	[ ]	1 = GULF
[2]	TILLERING	[ ]	2 = WIMMERA 62
[1]	WINTER HARDINESS	[ ]	3 = LINN
[2]	HIGH TEMP. STRESS RESISTANCE	[ ]	4 = PELO
[-]	TURF PERSISTENCE	[ ]	5 = NORLEA
[2]	PLANT COLOR	[ ]	6 = ABERYSTWYTH S-23
[3]	VERTICAL SEEDLING GROWTH RATE	[ ]	7 = MANHATTAN
[-]	CROWN DENSITY	[ ]	8 = PENNFINE
[-]	MOWER SHREDDING RESISTANCE	[x]	9= Kleingrass

18. GIVE AREA OF ADAPTATION AND INTENDED USE: Generally south of 32nd parallel in Texas

19. GIVE AREA TEST RESULTS PRESENTED FROM: Texas

COMMENTS:

Exhibit 13D. Additional Description of Variety

Panicum coloratum is a polymorphic species with a wide range in morphological characteristics. Plants vary in leaf width, plant height, plant color, plant pubescence, inflorescence color, and growth habit. Blue to blue-green glaucous plants generally have wide leaves compared to medium dark green plants which have narrower leaves. The glaucous characteristic varies from completely glaucous to slightly glaucous to none. Most plants develop a purple coloration at the nodes with very dark green plants and plants under low temperature stress having more purple coloration. Some plants develop purple inflorescences (purple glumes and sterile lemma) while light green is the predominant color. Geniculate stems are common in the species though erect plants have less of this tendency. Plants vary widely in pubescence from completely glabrous to highly pubescent. Blue and blue-green plants are always glabrous.

Kleingrass 75 was not selected for any of these plant characteristics. Thus, plant to plant variation occurs and the cultivar cannot be classified specifically for these morphological traits. Verde plant populations have few mildly blue-green slightly glaucous plants, but the population is predominantly medium green in color, approximately 20 to 25% of the plants with some leaf blade surface pubescence, mostly erect growth habit (as contrasted to either geniculate or decumbent). Except in percentage of plants with pubescence, Verde does not differ perceptibly in morphological characteristics to Kleingrass 75.

Agronomically, Verde equals or exceeds Kleingrass 75. In two field studies, Verde produced dry matter yields not significantly different to Kleingrass 75, while in one field study it exceeded Kleingrass 75 slightly and significantly (Tables 7, 8, 9). Verde forage quality (in vitro dry matter digestibility) is not significantly different to Kleingrass 75 but has consistently been 1 to 3 digestibility units higher than Kleingrass 75 (Tables 8, 10).

The acceptability of kleingrass seed as a source of feed for game birds has been confirmed repeatedly by the observations by producers that game birds, especially quail, increase in number following the establishment of kleingrass stands. Acceptability of the seed was confirmed further by a controlled study using caged quail given free choice of standard game bird seed mixture and kleingrass seed. The kleingrass seed made up almost 30% of the feed intake in this study and bird weights were not significantly different to those on a 100% game bird seed diet. It is assumed that Kleingrass seed are near minimal in size for acceptability in nature and that an increase in size would enhance the game bird value of the cultivar. This has not been verified by research and probably will not be but it seems a reasonable assumption.

Table 7. Dry matter yield of kleingrass cultivars at College Station, Texas, 1978-1980.

Cultivar	Kg/ha/cutting[1]
Verde	4088
Kleingrass 75	4396

Average of total of 8 cuttings over a 3-year period, values not significantly different.

Table 8. Dry matter yield and digestibility of kleingrass cultivars cut at two heights, College Station, Texas, 1978.

Cultivar	Agronomic treatment 10 cm height	20 cm height	Average
		Kg/ha	
Verde	9978 a[1]	9391 b	9684 a
Kleingrass 75	8282 b	9849 a	9066 b
		IVDMD	
Verde	60±1.4[2]	59±1.6	59.5±1.01
Kleingrass 75	58±1.5	57±1.5	57.5±1.01

[1]Values in column followed by same letter are not significantly different (.05 level), Duncan's Multiple Range.

[2]95% confidence interval.

Table 9. Dry matter production of kleingrass cultivars harvested at two intervals, College Station, 1980-81.

Cultivars	Kg/ha[1]			
	1980 Single harvest	3-week interval	1981 6-week interval	1981 average
Verde	2460	7305	9730	8518
Kleingrass 75	2182	6984	8884	7934

[1]Values for cultivars not significantly different, 5% level.

Table 10. In vitro dry matter digestibility (IVDMD), College Station, Texas.

Cultivar	% IVDMD 1978			1981			
	Aug. 16	Sep. 29	Avg.	Jun. 12	Aug. 4	Sep. 16	Avg.
Verde	62	53	58 NS	57	61	62	60 NS
Kleingrass 75	61	49	55 NS	54	59	64	59 NS

Table 11. Kleingrass seed consumption and bird performance of caged quail.

Feed offered	Amount of feed consumed g/bird/day	% kleingrass in consumed feed	Final bird weight, g/bird[1]
Standard diet	17.3	-	208
Standard diet + kleingrass	18.1	28.6	203

[1]Values not significantly different.